

Accelerator Physics

Beam studies and issues

Fulvia Pilat

Summary

Overview of Run 2000
beam studies

preparation, teams
measurements
analysis

Plans for Run 2001
beam studies

commissioning studies
machine development studies
organization

Parallel session agenda

studies, RF, polarization

Run2000 Beam studies: preparation & teams

Development of a **beam study program** for RHIC:

- **commissioning plan**
- **BNL Workshop on Accelerator Physics Experiments** (February 21-22, 2000)
<http://www.agsrhichome.bnl.gov/LHC/org/Beam2000/index.html>
- **needs for machine performance improvement during run**

Plans and beam activity during Run2000 summarized in **CAD/AP Note 22**

machine optics

Satogata, Bai, Trbojevic

IR studies

Pilat, Ptitsyn, Cardona
Koutchouk, Sen

IBS/longitudinal/nonlinear

Fischer, Cameron, Tepikian
Schmidt, Bruning

collimation/luminosity

Drees, Fliller

beam-beam

Fischer

Run 2000 beam studies - measurements

Done (Au operations)

Planned (PP operations)

IBS
Nonlinear
W.Fischer

nonlinear detuning (inj)
chromaticity vs. time (inj, sto)
long. profile vs. time (inj, sto)
IBS (IPM WCM Schottky) (inj)

“IBS” integrated Blue (inj) - p
Phobos beam profile
dynamic aperture (inj)
frequency analysis

IR Studies
F. Pilat

local decoupling IP8 Yellow
IR bumps Blue IP2 IP6 IP8
IR bumps Yellow IP2 IP6 IP8
frequency analysis

IR bumps Blue Yellow IP10
IR bumps at store
local decoupling at store
local sextupole correction

**Collimation/
Luminosity**
A. Drees

collimator performance Au
Vernier scans

collimator performance p
measure growth rates

Machine Optics
T.Satogata

TM kick + TBT orbit (sto)->beta
dispersion (sto)

β^* direct measurement

Beam Beam
W. Fischer

beam-beam tune shift

beam-beam tune shift with p

Beam studies: Run 2000 -> Run 2001

data analysis

in progress, to be reported during parallel sections

new challenges

longitudinal studies
instabilities (intensity)
polarization

controlled machine conditions

closed orbit control
tune setting/measurement/feedback
coupling (application)
chromaticity
machine model

new “tools” for studies

1000 turn acquisition on **all** BPM's
million-turn on **selected** BPM's
AC dipole
application integration

Beam studies: Run 2001

“start-up” operations

restart operations
luminosity increase

commissioning/luminosity
studies directly focused on
performance increase

part of commissioning and
luminosity increase plan
and scheduled as such

“steady-state” operations

experiments running
scheduled operations

dedicated studies
longer-term machine performance

plan (AGS model):

1 12h shift/ week

machine back to initial state

monday: discussion/decision

tuesday: time meeting

wednesday: dedicated time

coordinator RHIC: F.Pilat

coordinator Injectors: L.Ahrens

Agenda AP/RF parallel sessions

10:30 am

Optics/ Performance/ Luminosity

10'	M.Bai	Optics measurements/ AC dipole
10'	A. Drees	Luminosity/ Vernier scans
10'	R.Fliller	Collimation
15'	DISCUSSION	

11:15 am

Interaction Regions

15'	V.Ptitsyn	IR correction / linear
15'	F.Pilat	IR correction / nonlinear
15'	DISCUSSION	

1:30 pm

Longitudinal / IBS

15'	W.Fischer	IBS/ Time-dependent, nonlinear effects
10'	M.Blaskiewicz	Instabilities/ Injectors
10'	M.Brennan	Bunch length evolution
10'	DISCUSSION	

2:15 pm

Polarization

15'	H.Huang	Overview/ Polarimeter
10'	W.MacKay	Effect of snakes/ PP studies
10'	V.Ptitsyn	Beam control for polarization
10'	DISCUSSION	